

**RULES  
OF  
THE TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION  
DIVISION OF WATER POLLUTION CONTROL**

**CHAPTER 1200-4-3  
GENERAL WATER QUALITY CRITERIA**

**TABLE OF CONTENTS**

1200-4-3-.01	Tennessee Water Quality Control Board	1200-4-3-.07	Ground Water Classification
1200-4-3-.02	General Considerations	1200-4-3-.08	Ground Water Criteria
1200-4-3-.03	Criteria for Water Uses	1200-4-3-.09	Site Specific Impaired Classification Application Process
1200-4-3-.04	Definitions	1200-4-3-.10	Point of Classification Change
1200-4-3-.05	Interpretation of Criteria	1200-4-3-.11	Appeals
1200-4-3-.06	Tennessee Antidegradation Statement		

**1200-4-3-.01 TENNESSEE WATER QUALITY CONTROL BOARD**

The Water Quality Control Act, T.C.A., §69-3-101, et seq., makes it the duty of the Water Quality Control Board to study and investigate all problems concerned with the pollution of the Waters of the State and with its prevention, abatement, and control; and to establish such standards of quality for any Waters of the State in relation to their reasonable and necessary use as the Board shall deem to be in the public interest; and establish general policies relating to pollution as the Board shall deem necessary to accomplish the purposes of the Act. The following general considerations and criteria shall be used to determine the permissible conditions of waters with respect to pollution and preventative or corrective measures required to control pollution in various waters or in different sections of the same waters.

**Authority:** T.C.A. §§4-5-201 et seq., and 69-3-105. **Administrative History:** Original rule certified June 7, 1974. Amendment filed December 1, 1975; effective December 30, 1975. Amendment filed November 25, 1977; effective December 26, 1977. Amendment filed March 30, 1983; effective April 29, 1983. Amendment filed July 16, 1991; effective August 30, 1991. Amendment filed May 16, 1995; effective July 30, 1995. Amendment filed July 13, 1999; effective October 11, 1999.

**1200-4-3-.02 GENERAL CONSIDERATIONS**

- (1) Tennessee water quality standards shall consist of the General Water Quality Criteria and the Antidegradation Statement found in Rule 1200-4-3, and the Use Classifications for Surface Waters found in Rule 1200-4-4.
- (2) Waters have many uses which in the public interest are reasonable and necessary. Such uses include: sources of water supply for domestic and industrial purposes; propagation and maintenance of fish and other aquatic life; recreation in and on the waters including the safe consumption of fish and shellfish; livestock watering and irrigation; navigation; generation of power; propagation and maintenance of wildlife; and the enjoyment of scenic and aesthetic qualities of waters.
- (3) The rigid application of uniform water quality is not desirable or reasonable because of the varying uses of such waters. The assimilative capacity of a stream for sewage and waste varies depending upon various factors and including the following: volume of flow, depth of channel, the presence of falls or rapids, rate of flow, temperature, natural characteristics, and the nature of the stream. Also, the relative importance assigned to each use will differ for different waters and sections of waters.
- (4) In order to permit the reasonable and necessary uses of the Waters of the State, existing pollution should be corrected as rapidly as practicable, and future pollution prevented through the best available

(Rule 1200-4-3-.02, continued)

technology economically achievable or that greater level of technology necessary to meet water quality standards; i.e., modeling and stream survey assessments, treatment plants or other control measures.

- (5) Sewage, industrial wastes, or other wastes, as defined in the Water Quality Control Act, T.C.A. §69-3-101, et. seq., shall not be discharged into or adjacent to streams or other surface waters in such quantity and of such character or under such conditions of discharge in relation to the receiving waters as will result in visual or olfactory nuisances, undue interference to other reasonable and necessary uses of the water, or appreciable damage to the natural processes of self-purification. In relation to the various qualities and the specific uses of the receiving waters, no sewage, industrial wastes, or other wastes discharged shall cause conditions that fail to meet the water quality standards outlined herein. Bypassing (See definition) is prohibited except where necessary to prevent loss of life or severe property damage, or where excessive storm drainage or runoff would damage treatment facilities.
- (6) Since all Waters of the State are classified for more than one use, the most stringent criteria will be applicable. In cases where criteria for protection of more than one use apply at different stream flows (e.g., aquatic life versus recreation), the most stringent criteria will also be applicable.
- (7) Waters identified as wet weather conveyances according to the definition found in 1200-4-3-.04 (4), shall be protective of humans and wildlife that may come in contact with them and shall not degrade or adversely affect the quality of downstream waters. Applicable water quality standards will be maintained downstream of wet weather conveyances.
- (8) All fish and aquatic life metals criteria are expressed as total recoverable. For cadmium, copper, lead, nickel, silver, and zinc, calculation of NPDES permit limits will be based upon the dissolved fraction of the total recoverable criteria. The dissolved fraction will be calculated by application of approved conversion factors. Translators will be used to convert the dissolved fraction into a total recoverable permit limit. One of three approaches to metals translation will be used: (1) translator is the same as the conversion factor, (2) translator is based on relationships derived from STORET data, (3) a site-specific translator is developed. Where available, a site-specific translator is preferred. For assessing whether criteria for cadmium, copper, lead, nickel, silver, and zinc are exceeded by ambient water quality conditions, the total recoverable criteria will also be appropriately converted to the dissolved fraction, then translated, in order to allow direct comparison to the ambient data, if total recoverable. Site-specific criteria studies may be conducted on any appropriate fish and aquatic life criteria. When the Division develops or approves site-specific criteria for any substances for which generally applicable criteria have been adopted, the site-specific criteria will supersede the adopted criteria at that location. The Division can approve a site-specific criteria developed by others provided that an approved methodology is used and that both the study plan and results are approved. References on this subject include, but are not limited to: Technical Support Document for Water Quality-based Toxics Control (EPA - 505/2-90-001); Technical Guidance Manual for Performing Waste Load Allocations: Book VIII (EPA/600/6-85/002a/002b/002c); MinteqA2, An Equilibrium Metal Speciation Model (EPA/600/3-87/012); Water Quality Standards Handbook, Second Edition (EPA-823-B-93-002); The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit From a Dissolved Criteria (EPA-823-B-96-007), Interim Guidance on Determination and Use of Water-effect Ratios for Metals (EPA-823-B-94-001).
- (9) Interpretation and application of narrative criteria shall be based on available scientific literature and EPA guidance and regulations.

**Authority:** T.C.A. §§4-5-201 et seq., and 69-3-105. **Administrative History:** Original rule certified June 7, 1974. Amendment filed December 1, 1975; effective December 30, 1975. Amendment filed November 25, 1977; effective December 26, 1977. Amendment filed March 30, 1983; effective April 29, 1983. Amendment filed July 16, 1991; effective August 30, 1991. Amendment filed May 16, 1995; effective July 30, 1995. Amendment filed July 13, 1999; effective October 11, 1999.

(Rule 1200-4-3-.03, continued)

**1200-4-3-.03 CRITERIA FOR WATER USES**

- (1) Domestic Water Supply.
  - (a) Dissolved Oxygen - There shall always be sufficient dissolved oxygen present to prevent odors of decomposition and other offensive conditions.
  - (b) pH - The pH value shall lie within the range of 6.0 to 9.0 and shall not fluctuate more than 1.0 unit in this range over a period of 24 hours.
  - (c) Hardness or Mineral Compounds - The hardness of or the mineral compounds contained in the water shall not appreciably impair the usefulness of the water as a source of domestic water supply.
  - (d) Total Dissolved Solids - The total dissolved solids shall at no time exceed 500 mg/l.
  - (e) Solids, Floating Materials and Deposits - There shall be no distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits or sludge banks of such size or character as may impair the usefulness of the water as a source of domestic water supply.
  - (f) Turbidity or Color - There shall be no turbidity or color in amounts or characteristics that cannot be reduced to acceptable concentrations by conventional water treatment processes (See definition).
  - (g) Temperature - The maximum water temperature change shall not exceed 3°C relative to an upstream control point. The temperature of the water shall not exceed 30.5°C and the maximum rate of change shall not exceed 2°C per hour. The temperature of impoundments where stratification occurs will be measured at a depth of 5 feet or mid-depth, whichever is less, and the temperature in flowing streams shall be measured at mid-depth.
  - (h) Coliform - The concentration of the fecal coliform group shall not exceed 1,000 per 100 ml. as a geometric mean based on a minimum of 10 samples collected from a given sampling site over a period of not more than 30 consecutive days with individual samples being collected at intervals of not less than 12 hours. For the purpose of determining the geometric mean, individual samples having a fecal coliform group concentration of less than 1 per 100 ml shall be considered as having a concentration of 1 per 100 ml. In addition, the concentration of the fecal coliform group in any individual sample shall not exceed 5,000 per 100 ml.
  - (i) Taste or Odor - The waters shall not contain substances which will result in taste or odor that prevent the production of potable water by conventional water treatment processes.
  - (j) Toxic Substances - The waters shall not contain toxic substances, whether alone or in combination with other substances, which will produce toxic conditions that materially affect the health and safety of man or animals, or impair the safety of conventionally treated water supplies. Available references include, but are not limited to: Quality Criteria for Water (Section 304(a) of Public Law 92-500 as amended); Federal Regulations under Section 307 of Public Law 92-500 as amended; and Federal Regulations under Section 1412 of the Public Health Service Act as amended by the Safe Drinking Water Act, (Public Law 93-523). Limits set for some of the most commonly occurring toxic substances are as follows:

(Rule 1200-4-3-.03, continued)

Compound	Criteria (ug/L)	Compound	Criteria (ug/L)
Antimony	6	Diquat	20
Arsenic	50	Endothall	100
Beryllium	4	Glyphosate	700
Barium	2000	Hexachlorobenzene	1
Cadmium	5	Hexachlorocyclopentadiene	50
Chromium, total	100	Oxamyl (Vydate)	200
Lead	5	Picloram	500
Cyanide (as free cyanide)	200	Simazine	4
Mercury	2	2,3,7,8 TCDD (Dioxin)	0.00003
Nickel	100	Benzene	5
Selenium	50	Carbon tetrachloride	5
Thallium	2	1,2-Dichloroethane	5
		1,1-Dichloroethylene	7
		1,1,1-Trichloroethane	200
Alachlor	2	Trichloroethylene	5
Atrazine	3	Vinyl chloride	2
Carbofuran	40	para-Dichlorobenzene	75
Chlordane	2	cis 1,2-Dichloroethylene	70
Dibromo chloropropane	0.2	1,2-Dichloropropane	5
2,4 Dichlorophenoxyacetic	70	Ethyl benzene	700
Ethylene dibromide	0.05	Monochlorobenzene	100
Heptachlor	0.4	ortho-Dichlorobenzene	600
Heptachlor epoxide	0.2	Styrene	100
Lindane	0.2	Tetrachloroethylene	5
Methoxychlor	40	Toluene	1000
Polychlorinated biphenyls	0.5	trans 1,2-Dichloroethylene	100
2,4,5 Trichlorophenoxypropionic acid	50	Xylenes, total	10000
Pentachlorophenol	1	Dichloromethane	5
Benzo(a)pyrene	0.2	1,2,4-Trichlorobenzene	70
Dalapon	200	1,1,2-Trichloroethane	5
Di(2-ethylhexyl) adipate	400	Endrin	2.0
Di(2-ethylhexyl) phthalate	6	Toxaphene	3
Dinoseb	7		

- (k) Other Pollutants - The waters shall not contain other pollutants in quantities that may be detrimental to public health or impair the usefulness of the water as a source of domestic water supply.

(2) Industrial Water Supply.

- (a) Dissolved Oxygen - There shall always be sufficient dissolved oxygen present to prevent odors of decomposition and other offensive conditions.
- (b) pH - The pH value shall lie within the range of 6.0 to 9.0 and shall not fluctuate more than 1.0 unit in this range over a period of 24 hours.
- (c) Hardness or Mineral Compounds - The hardness of or the mineral compounds contained in the water shall not appreciably impair the usefulness of the water as a source of industrial water supply.
- (d) Total Dissolved Solids - The total dissolved solids shall at no time exceed 500 mg/l.

(Rule 1200-4-3-.03, continued)

- (e) Solids, Floating Materials and Deposits - There shall be no distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits or sludge banks of such size or character as may impair the usefulness of the water as a source of industrial water supply.
  - (f) Turbidity or Color - There shall be no turbidity or color in amounts or characteristics that cannot be reduced to acceptable concentrations by conventional water treatment processes.
  - (g) Temperature - The maximum water temperature change shall not exceed 3C° relative to an upstream control point. The temperature of the water shall not exceed 30.5°C and the maximum rate of change shall not exceed 2C° per hour. The temperature of impoundments where stratification occurs will be measured at a depth of 5 feet or mid- depth, whichever is less, and the temperature in flowing streams shall be measured at mid-depth.
  - (h) Taste or Odor - The waters shall not contain substances which will result in taste or odor that would prevent the use of the water for industrial processing.
  - (i) Toxic Substances - The waters shall not contain toxic substances whether alone or in combination with other substances, which will adversely affect industrial processing.
  - (j) Other Pollutants - The waters shall not contain other pollutants in quantities that may adversely affect the water for industrial processing.
- (3) Fish and Aquatic Life.
- (a) Dissolved Oxygen - The dissolved oxygen shall be a minimum of 5.0 mg/l except in limited sections of streams where it can be clearly demonstrated that (i) the existing quality of the water due to irretrievable man-induced conditions cannot be restored to the desired minimum of 5.0 mg/l dissolved oxygen; or (ii) the natural background quality of the water is less than the desired minimum of 5.0 mg/l. Such exceptions shall be determined on an individual basis, but in no instance shall the dissolved oxygen concentration be less than 3.0 mg/l. The dissolved oxygen concentrations shall be measured at mid-depth in waters having a total depth of ten (10) feet or less, and at a depth of five (5) feet in waters having a total depth of greater than ten (10) feet. The dissolved oxygen concentration of recognized trout waters shall not be less than 6.0 mg/l. The above criteria are applicable to tailwaters. The dissolved oxygen concentration of trout waters which have been designated as supporting a naturally reproducing population shall not be less than 8.0 mg/l.
  - (b) pH - The pH value shall lie within the range of 6.5 to 9.0 and shall not fluctuate more than 1.0 unit in this range over a period of 24 hours.
  - (c) Solids, Floating Materials and Deposits - There shall be no distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits or sludge banks of such size or character that may be detrimental to fish and aquatic life.
  - (d) Turbidity or Color - There shall be no turbidity or color in such amounts or of such character that will materially affect fish and aquatic life.
  - (e) Temperature - The maximum water temperature change shall not exceed 3C° relative to an upstream control point. The temperature of the water shall not exceed 30.5°C and the maximum rate of change shall not exceed 2C° per hour. The temperature of recognized trout waters shall not exceed 20°C. There shall be no abnormal temperature changes that may affect aquatic life unless caused by natural conditions. The temperature of impoundments where stratification occurs will be measured at mid-depth in the epilimnion for warm water fisheries and mid-depth in the hypolimnion for cold water fisheries. In the case of large impoundments (100 acres or

(Rule 1200-4-3-.03, continued)

larger) subject to stratification and recognized as trout waters, the temperature of the hypolimnion shall not exceed 20°C. The temperature in flowing streams shall be measured at mid-depth.

- (f) Taste or Odor - The waters shall not contain substances that will impart unpalatable flavor to fish or result in noticeable offensive odors in the vicinity of the water or otherwise interfere with fish or aquatic life. References include, but are not limited to: Quality Criteria for Water (section 304(a) of Public Law 92-500 as amended).
- (g) Toxic Substances - The waters shall not contain substances or a combination of substances including disease - causing agents which, by way of either direct exposure or indirect exposure through food chains, may cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction), physical deformations, or restrict or impair growth in fish or aquatic life or their offspring. References on this subject include, but are not limited to: Quality Criteria for Water (Section 304(a) of Public Law 92-500 as amended); Federal Regulations under Section 307 of Public Law 92-500 as amended. The following criteria are for the protection of fish and aquatic life:

Compound	Criterion Maximum Concentration ug/l (CMC)	Criterion Continuous Concentration ug/l (CCC)
Arsenic (III)	360	190
Cadmium *	1.8/3.9/8.6	0.7/1.1/2.0
Chromium, total	---	100
Chromium, VI	16	11
Copper *	9.2/17.7/34.1	6.5/11.8/21.4
Lead *	33.8/81.7/197	1.3/3.2/7.7
Mercury	1.69	0.908
Nickel *	789/1418/2549	87.7/158/283
Selenium	20	5
Silver *	1.23/4.1/13.4	---
Zinc *	65.0/117/211	58.9/106/191
Cyanide**	22	5.2
Chlorine (TRC)	19	11
Pentachlorophenol***	20	13
Aldrin	3.0	---
g-BHC - Lindane	2.0	0.08
Chlordane	2.4	0.0043
4-4'-DDT	1.1	0.001
Dieldrin	2.5	0.0019
a-Endosulfan	0.22	0.056
b-Endosulfan	0.22	0.056
Endrin	0.18	0.0023
Heptachlor	0.52	0.0038
Heptachlor epoxide	0.52	0.0038
PCB, each aroclor	---	0.014
Toxaphene	0.73	0.0002

\*Criteria for these metals are expressed as a function of total hardness (mg/L), as follows (values displayed above correspond to a total hardness of 50, 100 and 200 mg/L, respectively):

(Rule 1200-4-3-.03, continued)

$$CMC = \exp\{m_A[\ln(\text{hardness})] + b_A\}$$

$$CCC = \exp\{m_C[\ln(\text{hardness})] + b_C\}$$

	$m_A$	$b_A$	$m_C$	$b_C$
Cadmium	1.128	-3.828	0.7852	-3.490
Copper	0.9422	-1.464	0.8545	-1.465
Lead	1.273	-1.460	1.273	-4.705
Nickel	0.8460	3.3612	0.8460	1.1645
Silver	1.72	-6.52		
Zinc	0.8473	0.8604	0.8473	0.7614

If criteria are hardness-dependent, the chronic (CCC) and acute (CMC) concentrations shall be based on 25 mg/l hardness if the ambient hardness is less than 25 mg/l. Concentrations shall be based on the actual stream hardness if it is greater than 25 mg/l, however, no hardness greater than 400 mg/l will be used. For information concerning metals translation and site-specific criteria, see 1200-4-3-.02 (8).

\*\*If Standard Methods 4500-CN<sup>-</sup> I (Weak Acid Dissociable) or 4500-CN<sup>-</sup> G (Cyanides Amenable to Chlorination after Distillation) are used, this criterion may be applied as free cyanide.

\*\*\* Criteria for pentachlorophenol are expressed as a function of pH. Values displayed above correspond to a pH of 7.8 and are calculated as follows:

$$CMC = \exp(1.005(\text{pH}) - 4.830) \quad CCC = \exp(1.005(\text{pH}) - 5.290)$$

- (h) Other Pollutants - The waters shall not contain other pollutants that will be detrimental to fish or aquatic life.
  - (i) Coliform - The concentration of the fecal coliform group shall not exceed 1,000 per 100 ml as a geometric mean based on a minimum of 10 samples collected from a given sampling site over a period of not more than 30 consecutive days with individual samples being collected at intervals of not less than 12 hours. For the purposes of determining the geometric mean, individual samples having a fecal coliform group concentration of less than 1 per 100 ml shall be considered as having a concentration of 1 per 100 ml. In addition, the concentration of the fecal coliform group in any individual sample shall not exceed 5,000 per 100 ml.
  - (j) Biological Integrity - The waters shall not be modified through the addition of pollutants or through physical alteration to the extent that the diversity and/or productivity of aquatic biota within the receiving waters are substantially decreased or adversely affected, except as allowed under 1200-4-3-.06. The condition of biological communities will be measured by use of metrics suggested in guidance such as Rapid Bioassessment Protocols for Use in Streams and Rivers (EPA/444/4-89-001) or other scientifically defensible methods. Effects to biological populations will be measured by comparisons to upstream conditions or to appropriately selected reference sites in the same ecoregion (See definition).
- (4) Recreation.
- (a) Dissolved Oxygen - There shall always be sufficient dissolved oxygen present to prevent odors of decomposition and other offensive conditions.
  - (b) pH - The pH value shall lie within the range of 6.0 to 9.0 and shall not fluctuate more than 1.0 unit in this range over a period of 24 hours.

(Rule 1200-4-3-.03, continued)

- (c) Solids, Floating Materials and Deposits - There shall be no distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits or sludge banks of such size or character that may be detrimental to recreation.
- (d) Turbidity or Color - There shall be no turbidity or color in such amounts or character that will result in any objectionable appearance to the water.
- (e) Temperature - The maximum water temperature change shall not exceed 3C° relative to an upstream control point. The temperature of the water shall not exceed 30.5°C and the maximum rate of change shall not exceed 2C° per hour. The temperature of impoundments where stratification occurs will be measured at a depth of 5 feet, or mid- depth whichever is less, and the temperature in flowing streams shall be measured at mid-depth.
- (f) Coliform - The concentration of a fecal coliform group shall not exceed 200 per 100 ml, nor shall the concentration of the *E. coli* group exceed 126 per 100 ml, as a geometric mean based on a minimum of 10 samples collected from a given sampling site over a period of not more than 30 consecutive days with individual samples being collected at intervals of not less than 12 hours. For the purposes of determining the geometric mean, individual samples having a fecal coliform group or *E. coli* concentration of less than 1 per 100 ml shall be considered as having a concentration of 1 per 100 ml. In addition, the concentration of the fecal coliform group in any individual sample shall not exceed 1,000 per 100 ml.
- (g) Taste or Odor - The waters shall not contain substances that will result in objectionable taste or odor.
- (h) Toxic Substances - The waters shall not contain toxic substances, whether alone or in combination with other substances, that will render the waters unsafe or unsuitable for water contact activities including the capture and subsequent consumption of fish and shellfish, or will propose toxic conditions that will adversely affect man, animal, aquatic life, or wildlife. Human health criteria have been derived to protect the consumer from consumption of contaminated fish and water. The water and organisms criteria should only be applied to those waters classified for both recreation and domestic water supply. The criteria for recreation are as follows:



## CHAPTER 1200-4-3

	Water & Organisms Criteria ** (ug/L)	Organisms Only Criteria (ug/L)		Water & Organisms Criteria ** (ug/L)	Organisms Only Criteria (ug/L)
Compound			Compound		
<u>INORGANICS</u>			<u>BASE NEUTRALS</u>		
Antimony	14.0	4300	Acenaphthene	1200	2700
Arsenic (c)	50.0	50.0	Anthracene	9600	110000
			Benzidine (c)	0.0012	0.0054
			Benzo(a)anthracene (c)	0.044	0.49
Mercury	0.05	0.051	Benzo(a)pyrene (c)	0.044	0.49
Nickel	610	4600	3,4-Benzo(b)fluoranthene (c)	0.044	0.49
Thallium	1.7	6.3	Benzo(k)fluoranthene (c)	0.044	0.49
Cyanide	700	220000	Bis(Chlorethyl)ether (c)	0.31	14
			Bis(2-Chloro-isopropyl)ether	1400	170000
Dioxin **	0.000001	0.000001	Bis(2-Ethylhexyl)phthalate (c)	18	59
			Butylbenzyl Phthalate	3000	5200
			2-Chloronaphthalene	1700	4300
			Chrysene (c)	0.044	0.49
<u>VOLATILES</u>			Dibenz(a,h)Anthracene (c)	0.044	0.49
Acrolein	320	780	1,2-(o)Dichlorobenzene	2700	17000
Acrylonitrile (c)	0.59	6.6	1,3-(m)Dichlorobenzene	400	2600
Benzene (c)	12	710	1,4-(p)Dichlorobenzene	400	2600
Bromoform (c)	43	3600	3,3-Dichlorobenzidine (c)	0.4	0.77
Carbon tetrachloride (c)	2.5	44	Diethyl phthalate	23000	120000
Chlorobenzene	680	21000	Dimethyl phthalate	313000	2900000
Chlorodibromomethane (c)	4.1	340	Dibutyl phthalate	2700	12000
Chloroform (c)	57	4700	2,4-Dinitrotoluene (c)	1.1	91
Dichlorobromomethane (c)	5.6	460	1,2-Diphenylhydrazine (c)	0.4	5.4
1,2-Dichloroethane (c)	3.8	990	Fluoranthene	300	370
1,1-Dichloroethylene (c)	0.57	32	Fluorene	1300	14000
1,2-Dichloropropane	0.52	39	Hexachlorobenzene (c)	0.0075	0.0077
1,3-Dichloropropylene (Cis)	10	1700	Hexachlorobutadiene (c)	4.4	500
1,3-Dichloropropylene (Trans)	10	1700	Hexachlorocyclopentadiene	240	17000
Ethylbenzene	3100	29000	Hexachloroethane (c)	19	89
Methyl bromide	48	4000	Indeno(1,2,3-cd)Pyrene (c)	0.044	0.49
			Isophorone (c)	360	26000
			Nitrobenzene	17	1900
Methylene chloride			N-Nitrosodmethylamine (c)	0.0069	81
Dichloromethane (c)	47	16000	N-Nitrosodi-n-Propylamine	0.005	1.4
			N-Nitrosodiphenylamine (c)	50	160
			Pyrene	960	11000
1,1,2,2-Tetrachloroethane (c)	1.7	110			
Tetrachloroethylene (c)	8	88.5	<u>PESTICIDES</u>		
Toluene	6800	200000	Aldrin (c)	0.0013	0.0014
1,2-Trans-Dichloroethylene	700	140000	a-BHC (c)	0.039	0.13
			b-BHC (c)	0.14	0.46
1,1,2-Trichloroethane (c)	6	420	g-BHC - Lindane (c)	0.19	0.63
Trichloroethylene (c)	27	810	Chlordane (c)	0.0057	0.0059
Vinyl chloride (c)	20	5250	4,4'-DDT (c)	0.0059	0.0059
			4,4'-DDE (c)	0.0059	0.0059
			4,4'-DDD (c)	0.0083	0.0084
<u>ACID EXTRACTABLES</u>			Dieldrin (c)	0.0014	0.0014
2-Chlorophenol	120	400	a-Endosulfan	110	240
2,4-Dichlorophenol	93	790	b-Endosulfan	110	240

(Rule 1200-4-3-.03, continued)

2,4-Dimethylphenol	540	2300	Endosulfan Sulfate	110	240
2-Methyl-4,6-dinitrophenol -			Endrin	0.76	0.81
4,6-Dinitro-o-cresol	13.4	765	Endrin Aldehyde	0.76	0.81
2,4-Dinitrophenol	70	14000	Heptachlor (c)	0.0021	0.0021
Pentachlorophenol (c) (pH)	2.8	82	Heptachlor epoxide (c)	0.001	0.0011
Phenol	21000	4600000	PCB aroclors (c) (EPA 119-125)	0.00044	0.00045
2,4,6-Trichlorophenol (c)	21	65	PCB, total (c)	0.00044	0.00045
			Toxaphene (c)	0.0073	0.0075

(c) -  $10^{-5}$  risk level is used for all carcinogenic pollutants.

\* These criteria are for protection of public health due to consumption of water and organisms and should only be applied to these waters designated for both recreation and domestic water supply.

\*\* Total dioxin is the sum of the concentrations of all dioxin and dibenzofuran isomers after multiplication by Toxic Equivalent Factors (TEFs). Following are the TEFs currently recommended by EPA (subject to revision):

DIOXIN ISOMERS	TEF	FURAN ISOMERS	TEF
Mono-, Di-, & TriCDDs	0.0	Mono-, Di-, & TriCDFs	0.0
2,3,7,8 TCDD	1.0	2,3,7,8 TCDF	0.1
Other TCDDs	0.0	Other TCDFs	0.0
2,3,7,8 PeCDD	0.5	1,2,3,7,8 PeCDF	0.05
Other PeCDDs	0.0	2,3,4,7,8 PeCDF	0.5
		Other PeCDFs	0.0
2,3,7,8 HxCDD	0.1	Other PeCDFs	0.0
Other HxCDDs	0.0	2,3,7,8 HxCDF	0.1
		Other HxCDFs	0.0
2,3,7,8 HpCDD	0.01	2,3,7,8 HpCDF	0.01
Other HpCDDs	0.0	Other HpCDFs	0.0
OCDD	0.001	OCDF	0.001

- (i) Other Pollutants - The waters shall not contain other pollutants in quantities which may have a detrimental effect on recreation.
- (j) Fish Consumption Advisories - A public fishing advisory will be considered when the calculated risk of additional cancers exceeds  $10^{-4}$  for typical consumers or  $10^{-5}$  for atypical consumers (See definition). A “do not consume” advisory will be issued for the protection of typical consumers and a “precautionary advisory” will be issued for the protection of atypical consumers. The following formula will be used to calculate the risk of additional cancers :

$$R = qE$$

where:

R= Plausible-upper-limit risk of cancer associated with a chemical in a fisheries species for a human subpopulation.

q = Carcinogenic Potency Factor for the chemical ( $\text{mg kg}^{-1} \text{ day}^{-1}$ )<sup>-1</sup> estimated as the upper 95 percent confidence limit of the slope of a linear dose-response curve. Scientifically defensible Potency Factors will be used.

(Rule 1200-4-3-.03, continued)

E = Exposure dose of the chemical ( $\text{mg kg}^{-1} \text{ day}^{-1}$ ) from the fish species for the human subpopulation in the area. E is calculated by the following formula:

$$E = \frac{C \times I \times X}{W} \quad \text{where:}$$

C = Concentration of the chemical ( $\text{mg/kg}$ ) in the edible portion of the species in the area. The average levels from multiple fillet samples of the same species will be used. Catfish will be analyzed skin-off with the belly flap included in the sample. Gamefish and carp will be analyzed skin-on with the belly flap included in the sample. Sizes of fish collected for analysis will represent the ranges of sizes likely to be collected and consumed by the public. References on this subject include, but are not limited to: EPA's *Guidance for Assessing Chemical Contaminant Data for use in Fish Advisories*.

I = Mean daily consumption rate ( $\text{g/day}$  averaged over 70 year lifetime) of the fish species by the human subpopulation in the area. 6.5  $\text{g/day}$  will be used unless better site-specific information is available.

X = Relative absorption coefficient, or the ratio of human absorption efficiency to test animal absorption efficiency of the chemical. Assumed to be 1.0 unless better information is available.

W = Average human mass ( $\text{kg}$ ). 75  $\text{kg}$  will be used.

For substances for which the public health concern is based on toxicity, a "do not consume" advisory will be considered warranted when average levels of the substance in the edible portion of fish exceed U.S. Food and Drug Administration (FDA) Action Levels.

(5) Irrigation.

- (a) Dissolved Oxygen - There shall always be sufficient dissolved oxygen present to prevent odors of decomposition and other offensive conditions.
- (b) pH - The pH value shall lie within the range of 6.0 to 9.0 and shall not fluctuate more than 1.0 unit in this range over a period of 24 hours.
- (c) Hardness or Mineral Compounds - The hardness of or the mineral compounds contained in the water shall not impair its use for irrigation.
- (d) Solids, Floating Materials and Deposits - There shall be no distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits or sludge banks of such size or character as may impair the usefulness of the water for irrigation purposes.
- (e) Temperature - The temperature of the water shall not interfere with its use for irrigation purposes.
- (f) Toxic Substances - The waters shall not contain toxic substances whether alone or in combination with other substances which will produce toxic conditions that adversely affect the quality of the waters for irrigation.

(Rule 1200-4-3-.03, continued)

- (g) Other Pollutants - The waters shall not contain other pollutants in quantities which may be detrimental to the waters used for irrigation.
- (6) Livestock Watering and Wildlife.
  - (a) Dissolved Oxygen - There shall always be sufficient dissolved oxygen present to prevent odors of decomposition and other offensive conditions.
  - (b) pH - The pH value shall lie within the range of 6.0 to 9.0 and shall not fluctuate more than 1.0 unit in this range over a period of 24 hours.
  - (c) Hardness or Mineral Compounds - The hardness of or the mineral compounds contained in the water shall not impair its use for livestock watering and wildlife.
  - (d) Solids, Floating Materials and Deposits - There shall be no distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits or sludge banks of such size or character as to interfere with livestock watering and wildlife.
  - (e) Temperature - The temperature of the water shall not interfere with its use for livestock watering and wildlife.
  - (f) Toxic Substances - The waters shall not contain substances whether alone or in combination with other substances, which will produce toxic conditions that adversely affect the quality of the waters for livestock watering and wildlife.
  - (g) Other Pollutants - The waters shall not contain other pollutants in quantities which may be detrimental to the water for livestock watering and wildlife.
- (7) Navigation.
  - (a) Solids, Floating Materials and Deposits - There shall be no distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits or sludge banks of such size or character as to interfere with navigation.
  - (b) Other Pollutants - The waters shall not contain other pollutants in quantities which may be detrimental to the waters used for navigation.

**Authority:** T.C.A. §§4-5-201 et seq., and 69-3-105. **Administrative History:** Original rule certified June 7, 1974. Amendment filed December 1, 1975; effective December 30, 1975. Amendment filed November 25, 1977; effective December 26, 1977. Amendment filed March 30, 1983; effective April 29, 1983. Amendment filed July 16, 1991; effective August 30, 1991. Amendment filed May 16, 1995; effective July 30, 1995. Amendment filed July 13, 1999; effective October 11, 1999.

#### 1200-4-3-.04 DEFINITIONS

- (1) Bypassing - "Bypass" means the discharge of wastes from any portion of the collection or treatment system other than through the permitted outfall.
- (2) Conventional Water Treatment - Conventional water treatment as referred to in the criteria denotes coagulation, sedimentation, filtration, and chlorination or disinfection.
- (3) Mixing Zone - That section of a flowing stream or impounded waters in the immediate vicinity of an outfall where an effluent becomes dispersed and mixed.

(Rule 1200-4-3-.04, continued)

- (4) Wet Weather Conveyance - Wet weather conveyances are man-made or natural watercourses, including natural watercourses that have been modified by channelization, that flow only in direct response to precipitation runoff in their immediate locality and whose channels are above the groundwater table and which do not support fish or aquatic life and are not suitable for drinking water supplies. [T.C.A. § 4-5-202, T.C.A. § 69-3-105.]
- (5) Degradation - The alteration of the properties of waters by the addition of pollutants or removal of habitat. Alterations not resulting in the condition of pollution that are of a temporary nature or those alterations having de minimus impact (no measurable or less than 5 percent loss of assimilative capacity) will not be considered degradation. Degradation will not be considered de minimus if a substantial loss (more than 50 percent) of assimilative capacity has already occurred.
- (6) Ecoregion - A relatively homogeneous area defined by similarity of climate, landform, soil, potential natural vegetation, hydrology, or other ecologically relevant variables.
- (7) Reference site - least impacted waters within an ecoregion that have been monitored to establish a baseline to which alterations of other waters can be compared.
- (8) Atypical consumers are those persons in the vicinity of a stream or lake who due to physiological factors or previous exposure are more sensitive to specific pollutants than is the population in general. Examples of atypical consumers may include, but are not limited to: children; pregnant or nursing women; subsistence fishermen; frequent purchasers of commercially harvested fish; and agricultural, industrial, or military personnel who may have had previous occupational exposure to the contaminant of concern.
- (9) Terminology not specifically defined herein shall be defined in accordance with the Tennessee Water Quality Control Act. [T.C.A. §§ 69-3-101, et seq.]

**Authority:** T.C.A. §§4-5-201 et seq., and 69-3-105. **Administrative History:** Original rule certified June 7, 1974. Amendment filed December 1, 1975; effective December 30, 1975. Amendment filed November 25, 1977; effective December 26, 1977. Amendment filed March 30, 1983; effective April 29, 1983. Amendment filed July 16, 1991; effective August 30, 1991. Amendment filed May 16, 1995; effective July 30, 1995. Amendment filed July 13, 1999; effective October 11, 1999.

#### 1200-4-3-.05 INTERPRETATION OF CRITERIA

- (1) Interpretation of the above criteria shall conform to any rules and regulations or policies adopted by the Water Quality Control Board.
- (2) The effect of treated sewage or waste discharge on the receiving waters shall be considered after they are mixed with the waters and beyond a reasonable zone of immediate effect. The extent to which this is practicable depends upon local conditions and the proximity and nature of other uses of the waters. Such mixing zones (See definition) shall be restricted in area and length and shall not (i) prevent the free passage of fish or cause aquatic life mortality in the receiving waters; (ii) contain materials in concentrations that exceed recognized acute toxicity levels for biota representative of the aquatic community in the receiving waters; (iii) result in offensive conditions; (iv) produce undesirable aquatic life or result in dominance of a nuisance species; (v) endanger the public health or welfare; or (vi) adversely affect the reasonable and necessary uses of the area; (vii) create a condition of chronic toxicity beyond the edge of the mixing zone; and (viii) adversely affect nursery and spawning areas.
- (3) The technical and economical feasibility of waste treatment, recovery, or adjustment of the method of discharge to provide correction shall be considered in determining the time to be allowed for the development of practicable methods and for the specified correction, to the extent allowable under Rule 1200-4-3-.06 (5).

(Rule 1200-4-3-.05, continued)

- (4) The fish and aquatic life and livestock watering and wildlife criteria set forth shall be applied on the basis of the following stream flows: unregulated streams - stream flows equal to or exceeding the 7-day minimum, 10-year recurrence interval; regulated streams - all flows in excess of the minimum critical flow occurring once in ten years as determined by an analysis of records of operation and approved by the Commissioner of the Tennessee Department of Environment and Conservation. All other criteria shall be applied on the basis of stream flows equal to or exceeding the 30 day minimum 2 year recurrence interval.
- (5) In general, deviations from normal water conditions are undesirable, but the magnitude and duration of the deviations shall be considered in interpreting the above criteria.
- (6) The criteria and standards provide that all discharges of sewage, industrial waste, and other waste shall receive the degree of treatment or effluent reduction necessary to comply with water quality standards, or state or federal laws and regulations pursuant thereto, and where appropriate will comply with the "Standards of Performance" as required by the Tennessee Water Quality Control Act, (T.C.A., §§69-3-101, et seq.).
- (7) Where naturally formed conditions (e.g., geologic formations) or background water quality conditions are substantial impediments to attainment of the water quality standards, these natural or background conditions shall be taken into consideration in establishing any effluent limitations or restrictions on discharges to such waters.
- (8) There are cases in which the in-stream criteria as established by this rule are less than current chemical technological capabilities for analytical detection. In instances where permit limits established through implementation of these criteria are below analytical capabilities, compliance with those limits will be determined using the following detection limits, unless in specific cases other detection limits are demonstrated to be the best achievable because of the particular nature of the wastewater being analyzed:

## REQUIRED DETECTION LEVELS [RDL] (ug/l)

<u>INORGANICS</u>	<u>RDL</u>	<u>BASE NEUTRALS</u>	<u>RDL</u>
Antimony	3.0	Acenaphthylene (c)	2.3
Arsenic, total (c)	1.0	Anthracene	0.7
Arsenic (III) (c)	1.0	Benzo(a)anthracene (c)	0.3
Beryllium (c)	1.0	Benzo(a)pyrene (c)	0.3
Cadmium	1.0	3,4-Benzofluoranthene (c)	0.3
Chromium, total	1.0	Benzo(k)fluoranthene (c)	0.3
Chromium (III)	1.0	Bis(2-Chloroethyl)ether (c)	1.0
Chromium (VI)	10.0	Bis(2-Ethylhexyl)phthalate(c)	2.5
Copper	1.0	Chrysene	2.5
Lead	1.0	1,2-Dichlorobenzene	2.0
Mercury	0.2	1,3-Dichlorobenzene	2.0
Nickel	10.0	1,4-Dichlorobenzene -	
Selenium	2.0	para-Dichlorobenzene	4.4
Silver	1.0	Diethyl phthalate	1.9
Zinc	1.0	Dimethyl phthalate	1.6
Cyanide	5.0	Di-n-Butyl phthalate	2.5
		2,4-Dinitrotoluene (c)	1.0
Dioxin	0.00001	Fluoranthene	2.2
		Fluorene	0.3
<u>VOLATILES</u>		Hexachlorobenzene (c)	1.9
Acrolein	1.0	Hexachlorobutadiene (c)	5.0
Acrylonitrile (c)	1.0	Hexachloroethane (c)	0.5

(Rule 1200-4-3-.05, continued)

Benzene (c)	1.0	Nitrobenzene	10.0
Bromoform -		Phenanthrene	0.7
Tribromomethane (c)	1.0	Pyrene	0.3
Carbon tetrachloride (c)	1.0		
Chloroform -		<u>PESTICIDES</u>	
Trichloromethane (c)	0.5	Aldrin (c)	0.5
Dichlorobromomethane (c)	1.0	g-BHC - Lindane (c)	0.5
1,2-Dichloroethane (c)	1.0	Chlordane (c)	0.1
1,1-Dichloroethylene (c)	1.0	4,4'-DDT (c)	0.1
1,3-Dichloropropylene	1.0	4,4'-DDE (c)	0.1
Ethylbenzene	1.0	4,4'-DDD (c)	0.1
Methyl chloride -		Dieldrin (c)	0.05
Chloromethane (c)	1.0	a-Endosulfan	0.1
Methylene chloride -		b-Endosulfan	0.05
Dichloromethane (c)	1.0	Endrin	0.1
1,1,2,2-Tetrachloroethane (c)	0.5	Heptachlor (c)	0.05
Tetrachloroethylene (c)	0.5	Heptachlor epoxide (c)	0.08
Toluene	1.0	PCB-1242 (c)	0.5
1,1,1-Trichloroethane	1.0	PCB-1254 (c)	0.5
1,1,2-Trichloroethane (c)	0.2	PCB-1221 (c)	0.5
Trichloroethylene (c)	1.0	PCB-1232 (c)	0.5
Vinyl chloride (c)	2.0	PCB-1248 (c)	0.5
		PCB-1260 (c)	0.5
<u>ACID EXTRACTABLES</u>		PCB-1016 (c)	0.5
2-Methyl-4,6-dinitrophenol-		PCB, total (c)	0.5
4,6-Dinitro-o-cresol	24.0	Toxaphene (c)	0.5
2,4-Dinitrophenol	42.0		
Pentachlorophenol	5.0		
2,4,6-Trichlorophenol (c)	2.7	(c) - carcinogen	

- (9) The criteria shall be applied using the total recoverable method, unless otherwise specified, or the Division conducts or approves a chemical speciation study which determines the bioavailable or toxic fraction of a specific chemical.

**Authority:** T.C.A. §§4-5-201 et seq., and 69-3-105. **Administrative History:** Original rule certified June 7, 1974. Amendment filed December 1, 1975; effective December 30, 1975. Amendment filed November 25, 1977; effective December 26, 1977. Amendment filed March 30, 1983; effective April 29, 1983. Amendment filed July 16, 1991; effective August 30, 1991. Amendment filed May 16, 1995; effective July 30, 1995. Amendment filed July 13, 1999; effective October 11, 1999.

#### 1200-4-3-.06 TENNESSEE ANTIDegradation STATEMENT

- (1) It is the purpose of Tennessee's standards to fully protect existing uses of all surface waters as established under the Act. Existing uses are those actually attained in the waterbody on or after November 28, 1975. In bodies of water identified as Tier I by the Division, existing uses will be maintained by application of the General Water Quality Criteria. In Tier I waters found to not meet water quality standards for a substance, new or increased discharges of that substance will not be allowed.
- (2) The Tennessee Water Quality Standards shall not be construed as permitting the degradation (See definition) of high quality surface waters. Characteristics of high quality waters include:
  - (a) Waters that provide habitat for ecologically significant populations of aquatic or semi-aquatic plants or animals, including those proposed or listed for formal state or federal status.
  - (b) Waters that provide specialized recreational opportunities related to existing water quality.

(Rule 1200-4-3-.06, continued)

- (c) Waters that possess outstanding scenic or geologic values.
  - (d) Waters where existing conditions exceed water quality standards.
- (3) The Department may recommend to the Water Quality Control Board that certain waterbodies be designated as Outstanding National Resource Waters (ONRWs). These shall be high quality waters which constitute an outstanding National resource, such as waters of National and State parks and wildlife refuges and waters of exceptional recreational or ecological significance.

Designation of ONRWs must be made by the Water Quality Control Board and will be accomplished in accordance with Section 69-3-105(a)(1) of the Tennessee Water Quality Control Act and through the appropriate rulemaking process.

In surface waters designated by the Water Quality Control Board as ONRWs, no new discharges, expansions of existing discharges, or mixing zones will be permitted unless such activity will not result in degradation of the water quality. Existing water quality will be the criteria in these waters. Existing discharges, including existing upstream discharges, will be allowed at present levels. Physical alterations that cause degradation to the ONRW will not be allowed.

An assessment of environmental, economic, and social impacts will be prepared for each stream or stream segment proposed for Tier 3 ONRW designation. The assessment content and process will be determined by the Division of Water Pollution Control but will contain sufficient data and information to inform the Water Quality Control Board about environmental, economic, and social impact of ONRW designation. Further, the process will provide for comprehensive public participation with a solicitation of position statements from appropriate local government agencies including but not limited to county and municipal governments, Soil Conservation Districts, Utility Districts, as well as other local, state, and federal agencies that may have a responsibility for land and water resource management within the watershed of the proposed stream segment.

The following streams or portions of streams are designated as ONRW

<u>Waterbody</u>	<u>Portion designated as ONRW</u>
(a) Little River	Portion within Great Smoky Mountains National Park.
(b) Abrams Creek	Portion within Great Smoky Mountains National Park.
(c) West Prong Little Pigeon River	Portion within Great Smoky Mountains National Park
(d) Little Pigeon River	From the headwaters within Great Smoky Mountains National Park to the downstream boundary of Pittman Center.
(e) Big South Fork Cumberland River	Portion within Big South Fork National River and Recreation Area.
(f) Reelfoot Lake	Tennessee portion of the lake and its associated wetlands.



(Rule 1200-4-3-.06, continued)

The portion of the Obed River that is designated as a federal wild and scenic river as of June 22, 1999 is designated as tier 3; provided however, that if the current search for a regional water supply by the Cumberland Plateau Regional Water Authority results in a determination that it is necessary to utilize the Obed River as its source of drinking water, for that purpose the Obed River shall be designated tier 2 and any permit issued for that project, whether state, federal or otherwise, shall be considered under the requirements for tier 2.

Tier 3 ONRW designation for the Conasauga River within the boundaries of the Cherokee National Forest will be considered following preparation of an environmental, economic and social assessment of the public lands involved.

The division will present an interim report to the board regarding the scoping on the social and economic assessment of the Conasauga River and the water supply studies related to the Obed River at the April 1998 board meeting. Final report in order for decision on these two rivers will be presented in the October 1998 WQCB meeting.

- (4) In other surface waters identified by the Department as Tier II high quality waters in accordance with 1200-4-3-.06(2), no degradation will be allowed unless and until it is affirmatively demonstrated to the Water Quality Control Board, after full satisfaction of the intergovernmental coordination and public participation provisions of the State's continuing planning process, that a change is justifiable as a result of necessary economic or social development and will not interfere with or become injurious to any classified uses existing in such waters. Existing discharges, including existing upstream discharges, will be allowed at present levels. Regulated nonpoint sources will be controlled to the extent possible under the Water Quality Control Act and standards. Nonpoint sources exempted from permit requirements under the Water Quality Control Act should utilize all cost-effective and reasonable best management practices.
- (5) All discharges of municipal sewage, industrial waste, or other wastes shall receive the greatest degree of effluent reduction which the Commissioner of the Tennessee Department of Environment and Conservation determines to be achievable through application of stringent effluent limitations and schedules of compliance either promulgated by the Water Quality Control Board; required to implement any applicable water quality standards, including where practicable, a standard permitting no discharge of pollutants; necessary to comply with a State Water Quality Plan; or necessary to comply with other State or Federal laws or regulations.
- (6) In implementing the provisions of these rules as they relate to interstate streams, the Commissioner of the Tennessee Department of Environment and Conservation and the Tennessee Water Quality Control Board will cooperate with the appropriate Federal Agency in order to assist in carrying out responsibilities under the Federal Water Pollution Control Act, as amended.

**Authority:** T.C.A. §§4-5-201 et seq., and 69-3-105. **Administrative History:** Original rule certified June 7, 1974. Amendment filed December 1, 1975; effective December 30, 1975. Amendment filed November 25, 1977; effective December 26, 1977. Amendment filed March 30, 1983; effective April 29, 1983. Amendment filed July 16, 1991; effective August 30, 1991. Amendment filed May 16, 1995; effective July 30, 1995. Amendment filed July 13, 1999; effective October 11, 1999.

#### **1200-4-3-.07 GROUND WATER CLASSIFICATION.**

- (1) Purpose and Intent. It is one of the primary goals of the Tennessee Water Quality Control Act, T.C.A. 69-3-101 et. seq. (the "Act") to protect our valuable ground water resource. This rule classifies ground water across the state based on the factors stated in the Act, T.C.A. 69-3-105(a)(2) and establishes ground water quality criteria. The quality of ground water varies in Tennessee, some aquifers, or portions thereof, produce water with sufficient quality and quantity to be used by our citizens directly

(Rule 1200-4-3-.07, continued)

as a drinking water supply, other aquifers, or portions thereof, produce water in sufficient quantities to be used as a water supply but the water requires treatment before it can be used as such. Finally, some aquifers, or portions thereof, either have levels of naturally occurring constituents that make the resource unusable as a drinking water supply or the aquifer does not produce enough water to be used as a drinking water supply. The Board recognizes these rules apply to both permitting activities and response actions, as the term response is defined rule 1200-1-13-.02(1)(ff). The abatement of pollution is a goal of the Act and these rules. These rules provide appropriate flexibility in the regulatory process to protect our ground water resource. Allowing the beneficial use and/or reuse of brownfield areas for some permitted waste management activities reduces the use of greenfield areas for such purposes; which will conserve and protect our environment. However, the Site Specific Impaired classification does not apply in the context of activities involving areas with no ground water contamination. When ground water has been polluted by human activity, these rules set forth the procedures and standards for any necessary ground water remediation. In certain cases, due to site specific conditions, it may not be technologically feasible to clean up a site and/or the costs associated with such clean up or other factors may substantially outweigh the benefits of the restored resource. These rules establish a Site Specific Impaired classification that may apply in such areas after a thorough evaluation of feasibility of remediation and the potential risk of allowing contaminants to remain in ground water. The Board recognizes that several Divisions within the Department have a role in protecting ground water resources. It is not the intent of these rules to change the responsibilities of those programs. It is, however, the intent of these rules to provide a uniform basis for decisions involving ground water that may be applied by all Divisions of the Department. The Board does not intend these rules to affect in any way the ability of the State to seek natural resource damages from responsible parties when ground water has been contaminated by human activity.

(2) The ground water of the State is classified as follows:

(a) Special Source Ground Waters – This is ground water with exceptional quality and quantity, which may serve as a valuable source for water supply or which is ecologically significant. Special source ground water is vulnerable to contamination. Through the rulemaking process, the Water Quality Control Board will amend this rule to include the specific area of an aquifer which receives this designation. The Board shall clearly define the horizontal and vertical boundaries of ground water designated as Special Source Ground Water. In making this decision, the Board shall consider the following factors as submitted by the applicant:

1. The vulnerability of the aquifer, or portion thereof, to contamination due to hydrogeologic characteristics;
2. The number of persons or the proportion of the population using the ground water as a drinking water supply;
3. A comparison of the economic, social and environmental benefits and costs of maintaining the special source ground water with the economic, social and environmental benefits and costs of replacing the special source ground water;
4. An evaluation of the ecological and environmental impact should the quality of the special source ground water be compromised; and
5. Other pertinent information as deemed necessary by the petitioner or the Department.

Because such action is a rulemaking procedure, public input may be made as provided in the Uniform Administrative Procedures Act, T.C.A. 4-5-201 et. seq., but not as a contested case under T.C.A. 4-5-301 et. seq.

(Rule 1200-4-3-.07, continued)

- (b) General Use Ground Water - Except for aquifers, or portions thereof, that have been designated as Special Source Ground Water, all ground water which, as it is encountered, has naturally occurring levels of Total Dissolved Solids of 1000 parts per million or less is classified as General Use Ground Water upon certification by the Commissioner; provided the aquifer or portion of an aquifer can produce an average yield of at least one (1) gallon per minute over a twenty four (24) hour period in a properly constructed six (6) inch water well or a well of alternate construction and equivalent yield approved by the Department. The well shall have three well volumes purged before the twenty four (24) hour pump test begins. Any ground water which is used as a source of drinking water is also classified as General Use regardless of the well yield or the ground water's natural quality, unless that ground water meets the requirements for the Site Specific Impaired classification in 1200-4-3-.07(2)(d).
- (c) Limited Use Ground Water – This is ground water which is not currently a source of drinking water and is classified as Limited Use ground water upon certification by the Commissioner:
  - 1. Ground water with naturally occurring levels of Total Dissolved Solids above 1,000 ppm but less than 3,000 ppm; or
  - 2. Any aquifer or portion of an aquifer which is not capable of producing an average yield of one (1) gallon per minute over a twenty four (24) hour period in a properly constructed six (6) inch diameter water well or a well of alternate construction and equivalent yield approved by the Department. The well shall have three well volumes purged before the twenty four (24) hour pump test begins; or
  - 3. Ground water contaminated by human activity previous to November 19, 1980 if:
    - (i) there are no liable parties as defined in T.C.A., 68-212-202 (3) (B), (C), or (D); and
    - (ii) the current property owner did not cause the ground water contamination.

When ground water is encountered and certified by the Commissioner to be Limited Use as described above, the areal extent of the Limited Use ground water shall be delineated. This means the vertical and horizontal boundaries shall be established by sampling from properly constructed ground water monitoring wells, existing water wells and/or springs or by use of other appropriate means; including, but not limited to, topographical evaluations, dye traces, geologic and hydrologic modeling, etc. The horizontal boundaries of the Limited Use ground water cannot extend beyond the perimeter investigated as described above. The vertical boundaries of the Limited Use ground water can not exceed the depth of the ground water investigated as described above. Figures which clearly depict the horizontal and vertical boundaries of the Limited Use ground water must be submitted with the plans/reports required by the response action or permitting action.

Any ground water used as a drinking water source, at the time of classification, regardless of its natural quality or the aquifer yield cannot be classified as Limited Use ground water.

- (d) Site Specific Impaired Ground Water– This is ground water that has been contaminated by human activity and it is not technologically feasible to remediate the ground water to the level required by other classifications or if the costs of such a remediation substantially outweigh the benefits of the restored resource. Ground water shall be classified as Site Specific Impaired

(Rule 1200-4-3-.07, continued)

upon certification by the Commissioner. The process used to certify ground water as Site Specific Impaired is stated in 1200-4-3-.09.

1. When ground water is encountered and certified by the Commissioner to be Site Specific Impaired as described above, the areal extent of the Site Specific Impaired ground water shall be delineated. This means the vertical and horizontal boundaries shall be established by sampling from properly constructed ground water monitoring wells, existing water wells and/or springs or by use of other appropriate means; including, but not limited to, topographical evaluations, dye traces, geologic and hydrologic modeling, etc. The horizontal boundaries of the Site Specific Impaired ground water cannot extend beyond the perimeter investigated as described above. The vertical boundaries of the Site Specific Impaired ground water can not exceed the depth of the ground water investigated as described above. Figures which clearly depict the horizontal and vertical boundaries of the Site Specific Impaired ground water must be submitted to the Department in the plans/reports required by Rule 1200-4-3-.09.
- (e) Unusable Ground Water - The following ground water is classified as Unusable Ground Water upon certification by the Commissioner:
1. Ground water that is mineral, hydrocarbon or geothermal energy producing, or can be demonstrated by a permit applicant as part of a permit application for a Class II or III operation under Chapter 1200-4-6, Underground Injection Control, to contain minerals or hydrocarbons that, considering their quality and location are expected to be commercially producible; or
  2. Ground water at a depth and location which makes its use as a water supply economically or technically impractical; and
  3. Ground water with naturally occurring total dissolved solids of more than 3,000 ppm; or
  4. Ground water that was contaminated by human action in connection with the specific activity referenced below which:
    - (i) is located over a Class III well mining area subject to subsidence or catastrophic collapse; or
    - (ii) has been used to receive fluids and other substances from a Class I injection well, provided the Class I well was approved by the Department on or prior to September, 1985; or
  5. Ground water within the area excavated during the process of mining coal or other minerals pursuant to valid permits. Ground water beyond the excavation area will be classified as it is encountered as described elsewhere in this rule. Ground water which moves from the excavated area and becomes surface water shall be regulated as described in the surface water classification and criteria in these rules.

When ground water is encountered and certified by the Commissioner to be Unusable as described above, the areal extent of the Unusable ground water shall be delineated. This means the vertical and horizontal boundaries shall be established by sampling from properly constructed ground water monitoring wells, existing water wells and/or springs or by use of other appropriate means; including, but not limited to, topographical evaluations, dye traces, geologic and hydrologic modeling, etc. The horizontal boundaries of the Unusable ground water cannot extend beyond the perimeter investigated as described above. The vertical boundaries of the Unusable ground water can not exceed

(Rule 1200-4-3-.07, continued)

the depth of the ground water investigated as described above. Figures which clearly depict the horizontal and vertical boundaries of the Unusable ground water must be submitted with the plans/reports required by the response action or permitting action. Any aquifer or portion thereof classified for the placement of fluids or other substances by underground injection on or prior to September 1985 shall retain this classification and shall not be subject to the requirements of rules 1200-4-3-.09 and .10.

- (f) After the ground water in any specific location has been classified under these rules, a rulemaking action by the Water Quality Control Board will be required to reclassify that ground water.

**Authority:** T.C.A. §§4-5-201 et seq., and 69-3-105. **Administrative History:** Original rule filed June 28, 1999; effective September 11, 1999. Amendment filed July 13, 1999; effective October 11, 1999.

#### **1200-4-3-.08 GROUND WATER CRITERIA.**

The water quality criteria for the different classes are as follows:

- (1) Special Source Ground Water:
  - (a) except for naturally occurring levels, shall not contain constituents in excess of the concentrations listed in Table 1; and
  - (b) except for naturally occurring levels, shall not contain constituents at levels exceeding those in Rule 1200-4-3-.03 except that the criteria for fish and aquatic life and recreational use shall not apply.
- (2) General Use Ground Water:
  - (a) except for naturally occurring levels, shall not contain constituents in excess of the concentrations listed in Table 1; and
  - (b) except for naturally occurring levels, shall not contain constituents at levels exceeding those in Rule 1200-4-3-.03 except that the criteria for fish and aquatic life and recreational use shall not apply
- (3) Limited Use Ground Water:
  - (a) except for naturally occurring levels, shall not contain constituents at levels exceeding those for the use classifications in Rule 1200-4-3-.03 other than domestic water supply, fish and aquatic life and recreational use; and
  - (b) except for naturally occurring levels, in areas where historical contamination causes certain constituents to exceed the levels in rule 1200-4-3-.03, except for the criteria for domestic water supply, fish and aquatic life and recreational use, shall not contain those constituents at levels higher than those background levels; and
  - (c) shall contain no substances, whether alone or in combination with other substances, that are toxic, carcinogenic, mutagenic or teratogenic, other than those of natural origin, at levels and conditions which pose an unreasonable risk to the public health
- (4) Site Specific Impaired Ground Water:

(Rule 1200-4-3-.08, continued)

- (a) except for naturally occurring levels, shall contain no substances, whether alone or in combination with other substances, that are toxic, carcinogenic, mutagenic or teratogenic, other than those of natural origin, at levels and conditions which pose an unreasonable risk to public health or the environment;
  - (b) shall contain no other constituents which pose an unreasonable risk to the public health or the environment; and
  - (c) shall contain no constituents at levels that will prevent ground waters beyond the point of classification change from meeting the classification and criteria for those waters.
  - (d) Site Specific Impaired Criteria shall only apply to ground water that has been certified through the process set forth in Rule 1200-4-3-.09.
- (5) Unusable Ground Water:
- (a) except for naturally occurring levels, shall contain no substances, whether alone or in combination with other substances, that are toxic, carcinogenic, mutagenic or teratogenic, other than those of natural origin, at levels and conditions which pose an unreasonable risk to the public health; and
  - (b) shall contain no other constituents which pose an unreasonable risk to the public health

Table 1. Inorganic Criteria for General Use Ground Water

<u>Constituent</u>	<u>Concentration</u>
Aluminum	0.2 mg/l
Arsenic	0.05 mg/l
Asbestos	7,000,000 fibers/l
Barium	2.0 mg/l
Cadmium	0.005 mg/l
Chloride	250 mg/l
Chromium	0.1 mg/l (Total)
Copper	1.0 mg/l
Fluoride	4.0 mg/l
Iron	10.0 mg/l
Lead	0.05 mg/l
Manganese	0.5 mg/l
Mercury	0.002 mg/l
Nitrate	10.0 mg/l as Nitrogen
Nitrite	1.0 mg/l as Nitrogen
Total Nitrate & Nitrite	10.0 mg/l (as Nitrate)
Selenium	0.05 mg/l
Silver	0.1 mg/l
Sulfate	500 mg/l
TDS	1000 mg/l
(Total Dissolved Solids)	
Zinc	5.0 mg/l

**Authority:** T.C.A. §§4-5-201 et seq., and 69-3-105. **Administrative History:** Original rule filed June 28, 1999; effective September 11, 1999. Amendment filed July 13, 1999; effective October 11, 1999.

(Rule 1200-4-3-.09, continued)

**1200-4-3-.09 SITE SPECIFIC IMPAIRED CLASSIFICATION APPLICATION PROCESS**

- (1) Any person who encounters ground water that may meet the requirements for Site Specific Impaired, may apply for the ground water at the site to be certified by the Department as meeting those requirements, using the process set forth in this rule. Any costs involved in making the application shall be borne by the applicant. The application shall include the following, unless it is determined by the Department in writing that the site conditions render any of them unnecessary:
  - (a) An assessment of the horizontal and vertical extent of the contamination;
  - (b) An evaluation of the hydrogeology of the area including but not limited to the ground water flow rate and direction, permeability, recharge area, ground water classification and location of local water wells, springs and seeps;
  - (c) An evaluation of the area geology including but not limited to soil type, soil permeability, soil porosity, depth to bedrock, identification of geologic formations;
  - (d) A description of the corrective actions or response actions taken or proposed;
  - (e) The chemical characteristics of the constituents(s) including but not limited to the constituent's solubility, mobility, toxicity, and carcinogenicity, the nature of and the level of constituents to remain or be present in the ground water as well as the calculations and rationale used in the determination;
  - (f) a feasibility study which evaluates clean-up alternatives, the cost, and the time to complete each alternative;
  - (g) An evaluation of current and future ground water use within a (1/2) one-half mile radius of the contaminant plume; in karst areas the impact of conduit flow shall be evaluated;
  - (h) An evaluation of current and future land uses within a (1/2) one-half mile radius of the contaminant plume;
  - (i) An evaluation of the potential of the constituent to migrate through soil and ground water to:
    1. homes;
    2. buildings;
    3. surface waters;
    4. subsurface utilities; and
    5. adjacent properties;
  - (j) A description of any existing or proposed monitoring program to observe constituent levels in soil and ground water;
  - (k) Evaluation of the existing or anticipated actual exposure pathways (inhalation, ingestion, dermal contact, etc.) of the constituents and an assessment of the human health risks presented by exposure to the constituents as well as the impact, if any, of the constituents on fish and aquatic life pursuant to 1200-4-3;
  - (l) Consideration of the classification in Rule 1200-4-3-.07 that would apply to the ground water at the site if it were not contaminated.
  - (m) Analysis of the technological feasibility of cleaning up the ground water to the level necessary for the criteria that would apply to the ground water at the site if it were not contaminated and a

(Rule 1200-4-3-.09, continued)

comparison of the costs of investigation and cleanup and/or any other relevant factors with the benefits of the restored resource;

- (n) A description of how and when the contamination occurred, if known; and
  - (o) Other items as requested by the Department associated with the evaluation of the application to certify ground water as Site Specific Impaired.
- (2) The Department will issue a public notice, unless a process for public notice and input is required by other applicable regulations (in such case that regulation will be followed), when an application to certify ground water as Site Specific Impaired has been reviewed and a tentative decision to approve it has been made. The Department will conduct a public hearing concerning the application if the issue generates substantial public interest. The Department will explain the reasons it is proposing to certify the ground water as meeting the requirements for the Site Specific Impaired classification and will consider all written and oral comments received.
- (3) In the evaluation of an application to certify ground water as Site Specific Impaired, the Commissioner or this Board shall consider:
- (a) the extent of any threat to human health or safety;
  - (b) the extent of damage to the environment;
  - (c) technology commercially available to accomplish restoration;
  - (d) a comparison of the environmental and economic costs and benefits to be derived from ground water quality restoration with the environmental and economic costs and benefits to be derived from classification as Site Specific Impaired;
  - (e) the point of classification change;
  - (f) other appropriate information presented in the application.

**Authority:** T.C.A. §§4-5-201 et seq., and 69-3-105. **Administrative History:** Original rule filed June 28, 1999; effective September 11, 1999. Amendment filed July 13, 1999; effective October 11, 1999.

#### **1200-4-3-.10 POINT OF CLASSIFICATION CHANGE.**

- (1) “Point of Classification Change” shall mean the boundary location(s) within the relevant zone of an aquifer between the portion of the aquifer that is classified as Site Specific Impaired and any other classification. Compliance with the applicable criteria at this point shall be determined using sampling data, ground water modeling or other allowable mechanisms.
- (2) All areas with ground water classified as Site Specific Impaired must be owned or controlled by the person(s) subject to ground water cleanup or permitting obligations and/or subject to appropriate deed restrictions or other institutional controls. All locations outside the point of classification change must not exceed the applicable ground water criteria beyond the point of classification change.

**Authority:** T.C.A. §§4-5-201 et seq., and 69-3-105. **Administrative History:** Original rule filed June 28, 1999; effective September 11, 1999. Amendment filed July 13, 1999; effective October 11, 1999.

#### **1200-4-3-.11 APPEALS.**



- (1) Any applicant aggrieved by the actions of the Department in applying Rules 1200-4-3-.07 through 1200-4-3-.10 may petition this Board for a hearing provided a written petition is submitted to and received by the Commissioner;
  - (a) within thirty (30) days of certification of ground water or disapproval of an application for certification of ground water.; or
  - (b) within thirty (30) days following the expiration of the one hundred and twenty (120) calendar days from receipt of an application for certification of ground water as Site Specific Impaired if the Department has not made written request for additional information.
- (2) The Commissioner's determination shall be final and not subject to review unless the written petition for hearing is submitted and received within this time frame. The written petition must set forth the basis for the appeal as required by the Administrative Procedures Act, T.C.A. Section 4-5-101 et. seq., and the rules promulgated thereunder, particularly Rule 1360-4-1-.05.

**Authority:** T.C.A. §§4-5-201 et seq., and 69-3-105. **Administrative History:** Original rule filed June 28, 1999; effective September 11, 1999. Amendment filed July 13, 1999; effective October 11, 1999.